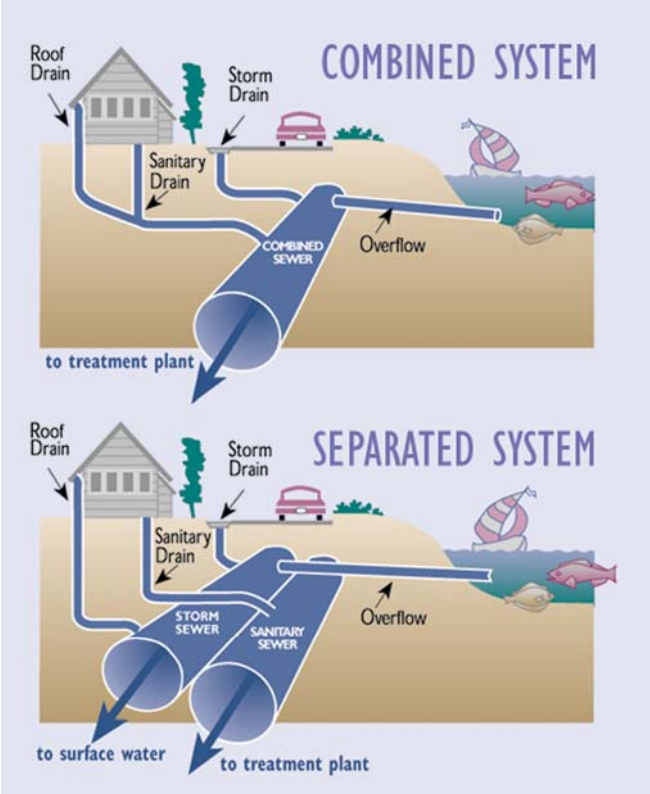
Conveyance System Improvement Program Overview

King County's regional wastewater system serves approximately 1.4 million residents within a 420-square-mile service area encompassing portions of King, Snohomish, and Pierce Counties. It is a large, integrated wastewater collection, conveyance, and treatment system operated by King County and 34 cities and sewer agencies. The system of pipes, pump stations, and storage facilities that conveys wastewater to the region's treatment plants is owned and operated by King County, and was constructed over many decades. Collectively, these pipelines, pump stations, and storage facilities are referred to as the region's wastewater *conveyance system*. The conveyance system is dynamic. It must be expanded over time in order to have adequate capacity necessary to convey wastewater flows from a growing population and it must be regularly upgraded to repair and replace system components that have reached the end of their service lives.

This technical memorandum identifies those portions of the conveyance system that will need to be expanded or replaced over time in order to make the system capable of handling peak flow[1] demands through 2050[2]. This memorandum is the County's initial step in updating the region's conveyance system plan in 2006. It provides a basis for identifying and evaluating alternative approaches to making capital investments in the conveyance system to address identified needs, and for seeking input from local wastewater agencies about the conveyance system plan update.

The technical memorandum lists needs for both the *combined* and *separated* portions of the conveyance system. Briefly, the combined portion of the conveyance system (located within the City of Seattle) collects and conveys both wastewater and stormwater to the West Point Treatment Plant. The rest of the region, including some portions of north Seattle, is served by a separated sewer



Combined and Separated Wastewater Conveyance Systems

[1] Peak flow is the highest base flow and infiltration/inflow expected to enter a wastewater system during wet-weather that a treatment plant and conveyance facilities are designed to accommodate.

[2] 2050 is the projected date when the regional wastewater service area will be fully built out and all portions of the service area will be connected into the wastewater treatment system.

system. Separated systems have separate collection and conveyance pipes for wastewater and stormwater. Separated wastewater systems dedicate their capacity to convey and treat wastewater only at the South or West Point Treatment Plants. The figure on the previous page illustrates the structural and functional differences of combined and separated sewer systems.

The conveyance system needs identified here (as well as in earlier conveyance system planning documents) account for the positive affect the planned Brightwater Treatment Plant will have on regional conveyance and treatment capacity. Any significant changes to the planned capacity of the Brightwater Treatment Plant or its construction schedule would affect both the number and timing of needed improvements to the regional conveyance system to manage projected wastewater flows.

Conveyance System Planning History

Because regional wastewater needs are always changing, planning for the regional conveyance system is an ongoing function for the Wastewater Treatment Division. Initial planning began in 1959 when the newly formed Municipality of Metropolitan Seattle (Metro) completed their Metropolitan Seattle Sewerage and Drainage Survey. This original plan was largely implemented in the 1960's, 70's, and early 80's. The conveyance plan was updated as a part of the Regional Wastewater Services Plan (RWSP), adopted by the King County Council in 1999. An update to the RWSP was presented to the council in April 2004 that included the latest data, information and analyses available at that time from the Conveyance System Improvement Program.

The conveyance system plan is being updated in 2006 because significant new needs were identified during development of the March 2005 Regional Needs Assessment (RNA) conducted for the Regional I/I Control Program. The purpose of the RNA was to identify CSI projects and costs in order to provide a baseline for conducting benefit/cost analyses of potential I/I reduction projects. The RNA, which is based on detailed data and information about base wastewater flows and infiltration and inflow (I/I) across the region, identified 63 capital conveyance projects needed through 2050. This conveyance system plan update further refines the needs identified in the RNA and categorizes those needs based on system age, condition or capacity.

Current Conveyance System Planning Process

This technical memorandum builds on the work contained in the RNA by re-evaluating the capacity needs identified for the RNA; and by reviewing age and facility inspection data about the conveyance system in order to begin to identify capital needs based on the condition of existing pipelines, pump stations, and regulator facilities. It is the first milestone in a-two-year effort to develop a complete new conveyance system plan. The major objectives of this conveyance planning process are to:

- Identify regional conveyance improvements necessary to meet the County's 20-year peak flow design standard; and
- Clearly document why there is a specific conveyance need, what improvement is needed, when, and its estimated cost.

The process for developing the Conveyance System Plan is as follows: